



# Garden News

## Tree Services Edition

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### Full Tree Services

Now up and running!

We have had an arborist on staff providing consultations and referrals for decades. Three years ago, we began developing our own in-house services. We completed that process in 2012 with the purchase of a large bucket truck.

We now provide every imaginable service: removal, pruning, spraying, fertilizing, trunk and soil injections. You name it, we do it!



60' Bucket Truck

## Current Events

### Winter Watering?

During prolonged dry weather, we do recommend supplemental watering. We have water trucks, tanks, pumps and hoses to provide whatever services you may need. In addition, you may wish to con-

sider activating your irrigation system for a one-time watering, followed by winterization.

Keep in mind that we own private water rights so we can provide water in most any drought condition. See inside for more info.

#### LOOK AHEAD

##### For February

- Begin spring clean up
- Police for trash as weather allows
- Dormant season pruning as needed

##### For March

- Spring clean up
- Soil testing



*Decorative mulch ring*

## *Did You Know?*

*Urban landscapes  
are a harsh  
environment.*

## Proper Mulching Techniques

(From the International Society of Arboriculture)

*Mulches are materials placed over the soil surface to maintain and improve soil conditions. Mulching is one of the most beneficial things a home owner can do for the health of a tree. Mulch can reduce water loss from the soil, minimize weed competition, and improve soil structure. Properly applied, mulch can give landscapes a handsome, well-groomed appearance. Mulch must be applied properly; if it is too deep or if the wrong material is used, it can actually cause significant harm to trees and other landscape plants.*

### Benefits of Proper Mulching

- ◆ Helps maintain soil moisture. Evaporation is reduced, and the need for watering can be minimized.
- ◆ Helps control weed. A 2"-4" layer of mulch will reduce the germination and growth of weeds.
- ◆ Mulch serves as nature's insulating blanket keeping soils cooler in summer and warmer in winter.
- ◆ Many types of mulch can improve soil aeration, structure, and drainage over time.
- ◆ Some mulches can improve soil fertility.
- ◆ A layer of much can inhibit certain plant diseases.
- ◆ Mulching around trees helps facilitate maintenance can reduce likelihood of trunk damage.
- ◆ Mulch can give planting beds a uniform, well-cared-for look.

Trees growing in a natural forest environment have their roots anchored in a rich, well-aerated soil full of essential nutrients. The soil is blanketed by leaves and organic materials that replenish nutrients and provide an optimal environment for root growth and mineral uptake. Urban landscapes, however, are typically a much harsher environment with poor soils, little organic matter, and large fluctuations in temperature and moisture. Applying a 2"-4" layer of organic mulch can mimic a more natural environment and improve plant health.

The root system of a tree is not a mirror image of the top. The roots of most trees can extend out a significant distance from the tree trunk. Although the guideline for many maintenance practices is the drip line—the outermost extension of the canopy—the roots can grow many times that distance. In addition, most of the fine, absorbing roots are located within inches of the soil surface. These roots, which are essential for taking up water and minerals, require oxygen to survive. A thin layer of mulch, applied as broadly as practical, can improve the soil structure, oxygen levels, temperature, and moisture availability where these roots grow.

## Types of Mulch

Mulches are available commercially in many forms. The two major types of mulch are inorganic and organic. Inorganic mulches include various types of stone, lava rock, pulverized rubber, geotextile fabrics, and other materials. Inorganic mulches do not decompose and do not need to be replenished often. On the other hand, they do not improve soil structure, add organic materials, or provide nutrients. For these reasons, most horticulturists and arborists prefer organic mulches.

Organic mulches include wood chips, pine needles, hardwood and softwood bark, cocoa hulls, leaves, compost mixes, and a variety of other products usually derived from plants. Organic mulches decompose in the landscape at different rates depending on the material and climate. Those that decompose faster must be replenished more often. Because the decomposition process improves soil quality and fertility, many arborists and other landscape professionals consider that characteristic a positive one, despite the added maintenance.

## Not Too Much

As beneficial as mulch is, too much can be harmful. The generally recommended **mulching depth is 2"-4"**. Unfortunately, many landscapes are falling victim to a plague of over-mulching. A new term, "mulch volcanoes," has emerged to describe mulch that has been piled up around the base of trees. Most organic mulches must be replenished, but the rate of decomposition varies. Some mulches, such as cypress mulch, remain intact for many years. Top dressing with new mulch annually (often for the sake of refreshing the color) creates a buildup to depths that can be unhealthy. Deep mulch can be effective in suppressing weeds and reducing maintenance, but it often causes additional problems.

## Problems Associated with Improper Mulching

- ◆ Deep mulch can lead to excess moisture in the root zone, which can stress the plant and cause root rot.
- ◆ Piling mulch against the trunk or stems of plants can stress stem tissues and may lead to insect and disease problems.
- ◆ Some mulches, especially those containing cut grass, can affect soil pH. Continued use of certain mulches over long periods can lead to micronutrient deficiencies or toxicities.
- ◆ Mulch piled high against the trunks of young trees may create habitats for rodents that chew the bark and can girdle the trees.
- ◆ Thick blankets of fine mulch can become matted and may prevent the penetration of water and air. In addition, a thick layer of fine mulch can become like potting soil and may support weed growth.
- ◆ Anaerobic "sour" mulch may give off pungent odors, and the alcohols and organic acids that build up may be toxic to young plants.

## *Mulching, con't.*



*Large rings*

*The decomposition process of mulch improves soil quality.*

## Mulching, con't.

### Proper Mulching

It is clear that the choice of mulch and the method of application can be important to the health of landscape plants. The following are some guidelines to use when applying mulch.

- ◆ Inspect plants and soil in the area to be mulched. Determine whether drainage is adequate. Determine whether there are plants that may be affected by the choice of mulch. Most commonly available mulches work well in most landscapes. Some plants may benefit from the use of a slightly acidifying mulch such as pine bark.
- ◆ If mulch is already present, check the depth. Do not add mulch if there is a sufficient layer in place. Rake the old mulch to break up any matted layers and to refresh the appearance. Some landscape maintenance companies spray water-soluble, vegetable based dye to improve the appearance.
- ◆ If mulch is piled against the stems or trunks, pull it back several inches so that the base of the trunk or root crown is exposed.
- ◆ Organic mulches usually are preferred to inorganic materials due to their soil-enhancing properties. If organic mulch is used, it should be well aerated and, preferably, composted. Avoid sour smelling mulch.
- ◆ Composted wood chips can make good mulch, especially when they contain a blend of leaves, bark, and wood. Fresh wood chips also may be used around established trees and shrubs. Avoid using non-composted wood chips that have been piled deeply without exposure to oxygen.
- ◆ For well-drained sites, apply a 2"-4" layer of mulch. If there are drainage problems, a thinner layer should be used. Avoid placing mulch against the tree trunks. Place mulch out to the tree's drip line or beyond.

*Organic mulches  
are the better  
choice for your  
trees.*



**Mulch wide—not deep.**







## CSU Extension Service

We are constantly referring to the CSU website for the newest research and information. It is also a great source to develop “best practices”. Here is what they have to say about winter watering.

*We own water rights and can provide water in most any conditions!*

## Fall and Winter Watering

by J.E. Klett and C. Wilson<sup>1</sup>(7/08)

### Quick Facts...

- Water trees, shrubs, lawns, and perennials during prolonged dry fall and winter periods to prevent root damage that affects the health of the entire plant.
- Water only when air and soil temperatures are above 40 degrees F with no snow cover.

Established large trees have a root spread equal to or greater than the height of the tree. Apply water to the most critical part of the root zone within the dripline.

Dry air, low precipitation, little soil moisture, and fluctuating temperatures are characteristics of fall and winter in many areas of Colorado. There often can be little or no snow cover to provide soil moisture, particularly from October through March. Trees, shrubs, perennials and lawns can be damaged if they do not receive supplemental water.

The result of long, dry periods during fall and winter is injury or death to parts of plant root systems. Affected plants may appear perfectly normal and resume growth in the spring using stored food energy. Plants may be weakened and all or parts may die in late spring or summer when temperatures rise. Weakened plants also may be subject to insect and disease problems.

### Plants Sensitive to Drought Injury

Woody plants with shallow root systems require supplemental watering during extended dry fall and winter periods. These include European white and paper birches; Norway, silver, red, Rocky Mountain, and hybrid maples; lindens, alder, hornbeams, dogwood, willows, and mountain ash. Evergreen plants that benefit include spruce, fir, arborvitae, yew, Oregon grape-holly, boxwood, and Manhattan euonymus. Woody plants benefit from mulch to conserve soil moisture.

Herbaceous perennials and ground covers in exposed sites are more subject to winter freezing and thawing. This opens cracks in soil that expose roots to cold and drying. Winter watering combined with mulching can prevent damage.

Lawns also are prone to winter damage. Newly established lawns, whether seed or sod, are especially susceptible to damage. Susceptibility increases for lawns with south or west exposures.

### Watering Guidelines

Water only when air temperatures are above 40 degrees F. Apply water at mid-day so it will have time to soak in before possible freezing at night. A solid layer (persisting for more than a month) of ice on lawns can cause suffocation or result in matting of the grass.

Plants receiving reflected heat from buildings, walls and fences are more subject to damage. The low angle of winter sun makes this more likely in south or west exposures. Windy sites result in faster drying of sod and plants and require additional water. Lawns in warm exposures are prone to late winter mite damage. Water is the best treatment to prevent turf injury.

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## *Winter Watering (continued)*

### Newly Planted vs. Established Plants

Newly planted trees are most susceptible to winter drought injury. Woody trees generally take one year to establish for each inch of trunk diameter. For example, a two inch diameter (caliper) tree takes a minimum of two years to establish under normal conditions.

Trees obtain water best when it is allowed to soak into the soil slowly to a depth of 12 inches. Methods of watering trees include: sprinklers, deep-root fork or needle, soaker hose or soft spray wand. Apply water to many locations under the dripline and beyond if possible. If you use a deep-root fork or needle, insert no deeper than 8 inches into the soil. As a general survival rule, apply 10 gallons of water for each diameter inch of the tree. For example, a **two-inch diameter tree needs 20 gallons per watering. Use a ruler to measure your tree's diameter.**

Newly planted shrubs require more water than established shrubs that have been planted for at least one year. The following recommendations assume shrubs are mulched to retain moisture. In dry winters, all shrubs benefit from winter watering from October through March. Apply 5 gallons two times per month for a newly planted shrub. Small established shrubs (less than 3 feet tall) should receive 5 gallons monthly. Large established shrubs (more than 6 feet) require 18 gallons on a monthly basis. Decrease amounts to account for precipitation. Water within the dripline of the shrub and around the base.

Herbaceous perennial establishment periods vary. Bare root plants require longer to establish than container plants. Perennials transplanted late in the fall will not establish as quickly as plants planted in spring. Winter watering is advisable with late planted perennials, bare root plants, and perennials located in windy or southwest exposures.

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### Fall and winter watering: during drought

Limited summer rainfall and water restrictions can deplete subsurface soil moisture. Upon digging, people may find little moisture at 8 to 12 inch depths where most tree roots are located. Paying special attention to fall watering is important for trees to mature buds and enter dormancy in a healthy condition. Consider tree watering in addition to whatever general landscape sprinkling local water restrictions allow in fall months. Colorado horticulture experts recommend watering underneath the branches within the circle bounded by the drip line. Water to a depth of 12 inches. Trees should receive ten gallons per inch of trunk diameter measured at knee height. This amount can be reduced by that supplied by general lawn watering or if rain or snow is received. Water trees three times per month in September. Cut back to one or two times per month from October through March, two times monthly for young trees and for evergreens. Mulch within a circle bounded by the drip line to a depth of 4 inches allowing 6 inches of space between the mulch and tree trunk. A mulch circle of any area will be beneficial whether it extends to the dripline or stops short of that. Many water application methods can be used. Consider soaker hoses, soil needles, or soft spray nozzles. On hard or compacted soils, soak, wait and soak again to avoid water runoff. Be especially careful with soil needles, also known as deep root feeders. Some people insert these well below a 12 inch depth, placing water out of reach of tree roots. Soil needles should be inserted at an angle to a depth of 6 to 8 inches. Leave the needle in place for 3 to 5 minutes with water turned on low to moderate pressure. Water the area under the branches in at least twelve sites for a medium sized or larger tree. Disperse water sites evenly within the circle bounded by the dripline. For new trees, water all four sites at least 3 feet from the trunk (stem). In dry years, established shrubs will need additional amounts of winter watering. Apply 5 gallons for a small shrub (less than 3 feet), and 18 gallons for a large shrub (more than 6 feet) on a monthly basis from October through March. Newly planted shrubs will require more winter water, twice monthly using these same amounts at each watering. Be sure to mulch shrubs to retain moisture.

## Pruning Services

### Pruning Mature Trees

*International Society of Arboriculture*

Pruning is the most common tree maintenance procedure. Although forest trees grow quite well with only nature's pruning, landscape trees require a higher level of care to maintain their safety and aesthetics. Pruning should be done with an understanding of how the tree responds to each cut. Improper pruning can cause damage that will last for the life of the tree, or worse, shorten the tree's life.



### Reasons for Pruning

Because each cut has the potential to change the growth of the tree, no branch should be removed without a reason. Common reasons for pruning are to remove dead branches, to remove crowded or rubbing limbs, and to eliminate hazards. Trees may also be pruned to increase light and air penetration to the inside of the tree's crown or to the landscape below. In most cases, mature trees are pruned as a corrective or preventive measure. Routine thinning does not necessarily improve the health of a tree. Trees produce a dense crown of leaves to manufacture the sugar used as energy for growth and development. Removal of foliage through pruning can reduce growth and stored energy reserves. Heavy pruning can be a significant health stress for the tree. Yet if people and trees are to coexist in an urban or suburban environment, then we sometimes have to modify the trees. City environments do not mimic natural forest conditions. Safety is a major concern. Also, we want trees to complement other landscape plantings and lawns. Proper pruning, with an understanding of tree biology, can maintain good tree health and structure while enhancing the aesthetic and economic values of our landscapes.

### When to Prune

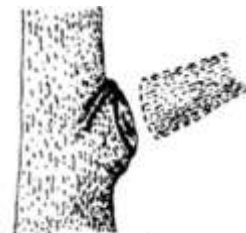
Most routine pruning to remove weak, diseased, or dead limbs can be accomplished at any time during the year with little effect on the tree. As a rule, growth is maximized and wound closure is fastest if pruning takes place before the spring growth flush. Some trees, such as maples and birches, tend to "bleed" if pruned early in the spring. It may be unsightly, but it is of little consequence to the tree.

A few tree diseases, such as oak wilt, can be spread when pruning wounds allow spores access into the tree. Susceptible trees should not be pruned during active transmission periods.

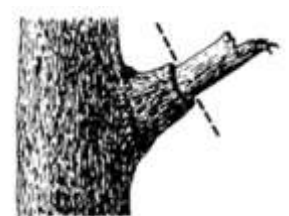
Heavy pruning just after the spring growth flush should be avoided. At that time, trees have just expended a great deal of energy to produce foliage and early shoot growth. Removal of a large percentage of foliage at that time can stress the tree.

### Making Proper Pruning Cuts

Pruning cuts should be made just outside the branch collar. The branch collar contains trunk or parent branch tissue and should not be damaged or removed. If the trunk collar has grown out on a dead limb to be removed, make the cut just beyond the collar. Do not cut the collar.



**Pruning cuts should be made just outside the branch collar.**



**On a dead branch that has a collar of live wood, the final cut should be made just beyond the outer edge of the collar**

## Pruning Services, continued

### Pruning Techniques

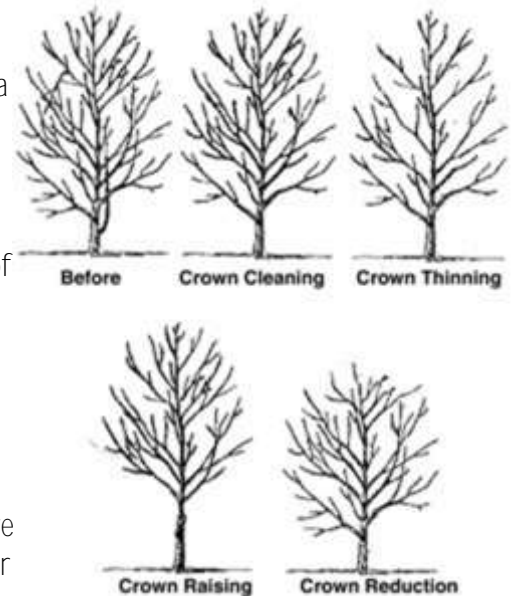
Specific types of pruning may be necessary to maintain a mature tree in a healthy, safe, and attractive condition.

Cleaning is the removal of dead, dying, diseased, crowded, weakly attached, and low-vigor branches from the crown of a tree.

Thinning is the selective removal of branches to increase light penetration and air movement through the crown. Thinning opens the foliage of a tree, reduces weight on heavy limbs, and helps retain the tree's natural shape.

Raising removes the lower branches from a tree in order to provide clearance for buildings, vehicles, pedestrians, and vistas.

Reduction reduces the size of a tree, often for clearance for utility lines. Reducing the height or spread of a tree is best accomplished by pruning back the leaders and branch terminals to lateral branches that are large enough to assume the terminal roles (at least one-third the diameter of the cut stem). Compared to topping, reduction helps maintain the form and structural integrity of the tree



### How Much Should Be Pruned?

The amount of live tissue that should be removed depends on the tree size, species, and age, as well as the pruning objectives. Younger trees tolerate the removal of a higher percentage of living tissue better than mature trees do. An important principle to remember is that a tree can recover from several small pruning wounds faster than from one large wound.

A common mistake is to remove too much inner foliage and small branches. It is important to maintain an even distribution of foliage along large limbs and in the lower portion of the crown. Over-thinning reduces the tree's sugar production capacity and can create tip-heavy limbs that are prone to failure.

Mature trees should require little routine pruning. A widely accepted rule of thumb is never to remove more than one-quarter of a tree's leaf-bearing crown. In a mature tree, pruning even that much could have negative effects. Removing even a single, large-diameter limb can create a wound that the tree may not be able to close. The older and larger a tree becomes, the less energy it has in reserve to close wounds and defend against decay or insect attack. The pruning of large mature trees is usually limited to removal of dead or potentially hazardous limbs.

### Wound Dressings

Wound dressings were once thought to accelerate wound closure, protect against insects and diseases, and reduce decay. However, research has shown that dressings do not reduce decay or speed closure and rarely prevent insect or disease infestations. Most experts recommend that wound dressings not be used. If a dressing must be used for cosmetic purposes, then only a thin coating of a nontoxic material should be applied.

### Hiring an Arborist

Pruning large trees can be dangerous. If pruning involves working above the ground or using power equipment, it is best to hire a professional arborist. An arborist can determine the type of pruning necessary to improve the health, appearance, and safety of your trees. A professional arborist can provide the services of a trained crew, with all of the required safety equipment and liability insurance.



## Tree Selection

*Tree selection is one of the most important investment decisions a home owner makes when landscaping a new home or replacing a tree lost to damage or disease. Considering that most trees have the potential to outlive the people who plant them, the impact of this decision is one that can influence a lifetime. Match the tree to the site, and both lives will benefit.*



*The best time to plant a tree is twenty years ago.*

### Tree Selection

The question most frequently asked of tree care professionals is “Which kind of tree do you think I should plant?” Before this question can be answered, a number of factors need to be considered. Think about the following questions:

- Why is the tree being planted? Do you want the tree to provide shade, fruit, or seasonal color, or act as a windbreak or screen? Maybe more than one reason?
- What is the size and location of the planting site? Does the space lend itself to a large, medium, or small tree? Are there overhead or belowground wires or utilities in the vicinity? Do you need to consider clearance for sidewalks, patios, or driveways? Are there other trees in the area? Are there barriers to future root growth, such as building foundations?
- Which type of soil conditions exist? Is the soil deep, fertile, and well drained, or is it shallow, compacted, and infertile?
- ◆ Which type of maintenance are you willing to provide? Do you have time to water, fertilize, and prune the newly planted tree until it is established, or will you be relying on your garden or tree service for assistance?

Ask and answer these and other questions before selecting a tree.

*The second best time is now.*

## Tree Function

Trees make our surroundings more pleasant. Properly placed and cared for, trees increase the value of our real estate. **A large shade tree provides relief from summer’s heat and, when properly placed, can reduce summer cooling costs.** An ornamental tree provides beautiful flowers, leaves, bark, or fruit. Evergreens with dense, persistent leaves can be used to provide a windbreak or a screen for privacy. A tree that drops its leaves in the fall allows the sun to warm a house in the winter. A tree or shrub that produces fruit can provide food for the owner and/or attract birds and wildlife into your home landscape. Street trees decrease the glare from pavement, reduce runoff, filter out pollutants, and add oxygen to the air we breath. Street trees also improve the overall appearance and quality of life in a city or neighborhood.

## Site Conditions

Selecting a tree that will thrive in a given set of site conditions is the key to long-term tree survival. The following is a list of the major site conditions to consider before selecting a tree for planting:

- soil conditions
- exposure (sun and wind)
- human activity
- drainage
- space constraints
- hardiness zone

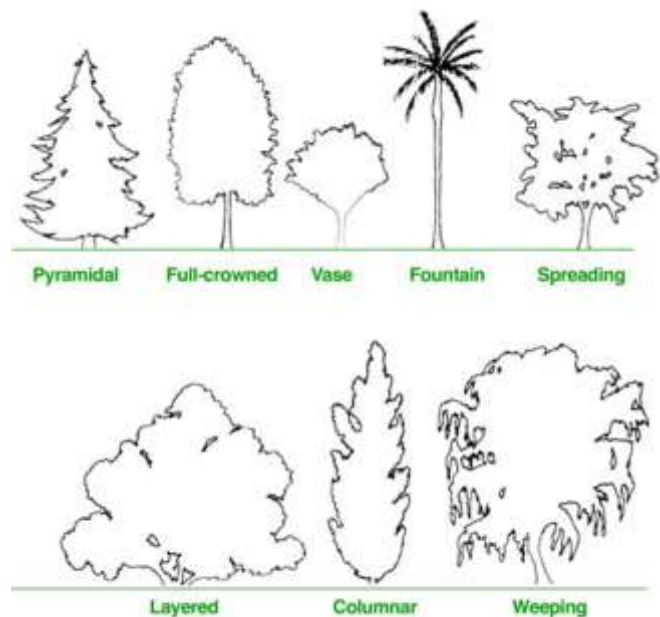
## Tree Selection, continued

### Tree Function

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### Form and Size

A basic principle of modern architecture is “form follows function.” This is a good rule to remember when selecting a tree. Selecting the right form (shape) to complement the desired function (what you want the tree to do) can significantly reduce maintenance costs and increase the tree's value in the landscape. When making a selection about form, also consider mature tree size. Trees grow in a variety of sizes and shapes, as shown below. They can vary in height from several inches to several hundred feet. Select a form and size that will fit the planting space provided. Depending on your site restrictions, you can choose from among hundreds of combinations of form and size. You may choose a small-spreading tree in a location with overhead utility lines. You may select a narrow, columnar form to provide a screen between two buildings. You may choose large, vase-shaped trees to create an arbor over a driveway or city street. You may even determine that the site just does not have enough space for a tree of any kind.



### Soil Conditions

The amount and quality of soil present in your yard can limit planting success. In urban sites, the topsoil often has been disturbed and frequently is shallow, compacted, and subject to drought. Under these conditions, trees are continuously under stress. For species that are not able to handle these types of conditions, proper maintenance designed to reduce stress is necessary to ensure adequate growth and survival. Many arborists will, for a minor charge, take soil samples from your yard to test for fertility, salinity, and pH (alkalinity or acidity). The tests will be returned with recommendations on ways to improve poor soil conditions with fertilizers or soil amendments (sand, compost, or manure) and will also help your local nursery or garden center recommend tree species that will do well in the soils found on your site.

### Exposure

The amount of sunlight available will affect tree and shrub species selection for a particular location. Most woody plants require full sunlight for proper growth and flower bloom. Some do well in light shade, but few tree species perform well in dense shade. Exposure to wind is also a consideration. Wind can dry out soils, causing drought conditions and damage to branches and leaves during storms, and can actually uproot newly planted trees that have

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## *Tree Selection, continued*

not had an opportunity to establish root systems. Special maintenance, such as staking or more frequent watering, may be needed to establish young trees on windy sites.

### Human Activity

This aspect of tree selection is often overlooked. The reality of the situation is that the top five causes of tree death are the result of things people do: soil compaction, underwatering, overwatering, vandalism, and the number one cause—planting the wrong tree—account for more tree deaths than all insect and disease-related tree deaths combined.

### Drainage

Tree roots require oxygen to develop and thrive. Poor drainage can remove the oxygen available to the roots from the soil and kill the tree. Before planting, dig some test holes 12 inches wide by 12 inches deep in the areas you are considering planting trees. Fill the holes with water and time how long it takes for the water to drain away. If it takes more than 6 hours, you may have a drainage problem. If so, ask your local garden center for recommendations on how to correct the problem, or choose a different site.

### Space Constraints

Many different factors can limit the planting space available to the tree: overhead or underground utilities, pavement, buildings, other trees, visibility. The list goes on and on. Make sure there is adequate room for the tree you select to grow to maturity, both above and below ground.

### Hardiness

**Hardiness is the plant's ability to survive in the extreme temperatures of the particular geographic region in which you are planting the tree.** Plants can be cold hardy, heat tolerant, or both. Most plant reference books provide a map of hardiness zone ranges. Although tropical areas are generally Zone 11, higher elevations have cooler temperatures that may warrant adjustment to the hardiness zone classification. Check with your local garden center for the hardiness information for your region. Before you make your final decision, make sure the plant you have selected is **“hardy” in your area.**

### Pest Problems

Insect and disease organisms affect almost every tree and shrub species. Every plant has its particular pest problems, and the severity varies geographically. These pests may or may not be life threatening to the plant. You should select plants resistant to pest problems for your area. Your local ISA Certified Arborist, tree consultant, or extension agent can direct you to information relevant to problem species for your location.

### Species Selection

Personal preferences play a major role in the selection process. Now that your homework is done, you are ready to select a species for the planting site you have chosen. Make sure you use the information you have gathered about your site conditions, and balance it with the aesthetic decisions you make related to your personal preferences.

The species must be suitable for the geographic region (hardy), tolerant to the moisture and drainage conditions of your soil, be resistant to pests in your area, and have the right form and size for the site and function you have envisioned.

Remember, if your site conditions tell you the species you selected will not do well under those conditions, do not be disappointed when the tree does not perform in the same way.

## Trees in Turf Areas

### Trees and Turf

Woody plants and turf grasses are critical components of design plans for homes, offices, and parks. Trees and turf offer distinct personal, functional, and environmental benefits. Personal preferences for color, fragrance, and form should complement the functional properties of size, shape, density, and placement of plant material.

We've all seen thinning grass under large shade trees, large surface tree roots that cause safety hazards and mowing obstacles, young trees that don't seem to grow, and tree trunks badly damaged by lawn mowers or string trimmers. All of these undesirable effects can be caused by trees and turf growing too closely together.



Turf grasses provide many of the same environmental benefits as trees. They

- change carbon dioxide into the oxygen we breathe
- cool the air by changing water into water vapor
- stabilize dust
- entrap air polluting gases

control erosion

Turf grasses, in addition to being environmentally beneficial, are attractive in formal and informal designs. There are many advantages to combining trees and turf in the landscape.

### Selection

When trees and turf are used in the same areas, extra attention must be given to plant material selection in addition to the usual hardiness, climatic, and soil needs. An effort should be made to make the trees and lawn compatible. Grass is generally a sun-loving plant. Most grass species will not grow well in areas that get less than 50 percent open sunlight; however, new varieties with improved shade tolerance are being introduced. Consult your garden center specialist or sod producer for recommendations of shade-tolerant grasses for your area.

In areas where the lawn is the primary design feature, select woody plants that do the least damage to grass growth and maintenance. The woody plants should be small, have an open canopy (to allow sunlight to penetrate to the ground), or have a high canopy. Select trees that do not root near the soil surface; surface rooting is most serious where shallow topsoil or composted clay soils are present. Remember, tree roots get larger as the tree gets older.

### Competition

Trees, shrubs, ground covers, and lawn grasses all require sunlight, water, and rooting space for growth. Each plant in the landscape competes with neighboring plants regardless of type or species. Some even produce chemicals that are exuded from roots to restrict growth of nearby plants. For each plant to do well, it must have adequate space. Because perennial woody plants increase in size each year, they require additional space over time. The landscape design should provide adequate space for these plants to mature.

**While shade is the biggest, most obvious problem trees create for turf growth, a tree's roots also contribute to poor turf performance.** Contrary to general thinking, most tree roots are in the top 2 feet of soil. More important, the majority of fine, water absorbing roots are in the top 6 inches of soil. Grass roots ordinarily occupy a much greater percentage of the soil volume than tree roots and outcompete them for water and nutrients, especially around young trees. However, grass root density is often much lower in areas where trees were established first. In these situations, tree roots compete much better for water and nutrients and prevent or reduce the success of establishing new turf.



## *Trees in Turf Areas, continued*

Competition is especially important when transplanting, seeding, or sodding. The newest plant in the area must be given special treatment and must receive adequate water, nutrients, and sunlight, which frequently means that competing sod should be removed from around transplanted trees and shrubs or that some of the lower branches should be removed from existing trees above a newly sodded lawn. In any case, do not do any tilling around trees.

Mulching is an alternative to turf around trees, and its use eliminates potential competition. A 2- to 4-inch layer of wood chips, bark, or other organic material over the soil under the drip line is recommended because it

- helps retain soil moisture
- helps reduce weeds and controls grass
- increases soil fertility when mulch decomposes
- improves appearance
- protects the trunk from injuries caused by mowing equipment and trimmers that often result in serious tree damage or death improves soil structure (better aeration, temperature, and moisture conditions)

## Maintenance Practices

Maintenance practices for trees and turf are different. Because tree and grass roots exist together in the upper 6 to 8 inches of the topsoil, treatment of one may damage the other. Fertilizer applied to one plant will also be absorbed by the roots of a nearby plant. Normally that is good, but excessive fertilization of either trees or turf can result in tree crown or grass blade growth greater than desired.

Many herbicides or weed killers that are used in turf can cause severe damage to trees when misapplied. Misapplication can occur on windy days, causing the drift to fall on non-target plants, or on hot days when the herbicide may vaporize and diffuse into the air. While most herbicides do not kill tree roots, some, such as soil sterilants and a few others, do. Herbicides that can cause tree damage have statements on their labels warning against using the product near trees.

Watering of lawns is beneficial to trees if the watering is done correctly. Trees need, on average, the equivalent of one inch of rain every seven to ten days, depending on the species. Tropical rain forest trees may require more. Frequent, shallow watering does not properly meet the needs of either trees or turf and can be harmful to both.

Turf growing under or near trees should be mowed at the top of its recommended mowing height. Mowing off no more than **one-third of the grass blade's height and letting the clippings remain on the lawn does much to ensure a healthy and vigorous lawn.** In an ideal situation, tree and turf maintenance would be handled by the same individual in order to maximize the benefits of all maintenance practices.

## Special Situations

- Placing fill dirt around existing trees. Fill dirt frequently is added around existing mature trees so that a level or more visually desirable lawn can be established. Fill dirt changes the ratio of oxygen to carbon dioxide around tree roots and the roots may subsequently die. Consult a tree care expert before adding fill or constructing soil wells around tree trunks.

- Establishing lawns around existing trees. Preparation of a seedbed for lawns requires disruption of the upper 4 to 6 inches of topsoil. This soil contains the feeder roots of trees. Damage to tree roots often results in declining tree tops.

Lawn watering in arid sites. Homes are sometimes built in woodlots. In arid regions, the watering that is required to maintain grass is especially damaging to dryland trees. Excess water at the tree trunk encourages growth of fungi that can kill trees.

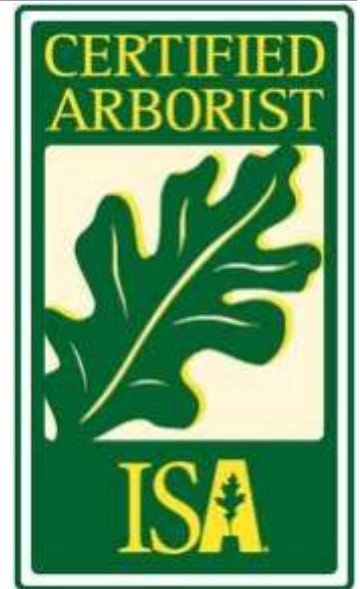
Thin turfgrass growing around trunk-scarred weak trees does not need to be a common sight in the landscape. With proper planning, proper plant selection and placement, and reasonable management, the many and varied benefits of both trees and turf can be readily achieved.

## *Health Care Act (for your trees)*

### Does Your Yard Have a Health Plan?

When is the last time your yard had a check-up? Just like people, plants need periodic examinations and treatments to help prolong their health. Plant health care (PHC) is a vital part of landscape management.

Preventative care, frequent check-ups, early detection, informed decision-making, and routine treatments that provide long term, stable solutions are regular duties of PHC programs. A PHC plan is multi-faceted and customer-driven, focusing on the health, growth, and beauty of a homeowner's yard.



"It's like an HMO plan for your yard," says Jim Skiera, Executive Director for the International Society of Arboriculture (ISA). "Adopting a plant healthcare program can prevent problems or keep them from getting serious. When homeowners and professionals work together, everyone benefits. Drastic, costly maintenance can be avoided while the value of the entire property increases."

The basic premise behind PHC is that if a plant is taken care of properly, natural defenses can be strengthened. Energy that would normally be used up fighting stressful factors can instead be utilized to build up defense systems. Regular check-ups and the removal of hazardous factors from the environment help to improve the health of a plant, the same as they would the health of a human.

### Maintaining a Plant Health Care (PHC) Program:

First, choose the right professional support. You would select a doctor carefully, so be sure to select the best professional to assist you in your PHC plan. Experts should ask questions, determine priorities, and discover the homeowner's expectations. Look for ISA Certified Arborists (found at [www.treesaregood.org](http://www.treesaregood.org)) or certified landscape professionals who are well-trained, educated, and experienced professionals familiar with landscape plants, their needs, and the pests and diseases most likely to attack.

Every yard is different, so individual care is important. Frequent monitoring aids in early detection and is key to the long-term health of plants. Professionals will alert you to any existing or anticipated problems then suggest all possible treatment options and alternatives-just like a doctor would a patient. The best choices usually involve natural processes that are least intrusive. Chemical treatments should be used as a last resort. Homeowners and professionals should work together to decide what is best for the yard.

Expensive remedies are often employed after a yard has already been badly damaged. These practices are often unsuccessful and cost homeowners significant amounts of money in planting and maintenance. Proactive PHC programs cost considerably less than reactive interventions because they help ensure the health and beauty of plants and landscapes, lowering maintenance costs and increasing property values.

"The long-term savings is virtually guaranteed," Skiera says. "Not only will a plant health care program enhance the well-being of plants, but it also will improve the mood and bank account of the homeowner."

## *Most (un)Wanted Insects*

### Oystershell Scale

by W.S. Cranshaw <sup>1</sup> (12/08)

#### Quick Facts...

- Oystershell scale is a common insect pest of many woody plants in Colorado.
- Oystershell scales feed on the plant by sucking plant sap. Heavy infestations can kill branches and even cause the decline and death of the tree.
- In most areas of Colorado, there is only one generation per year.
- Oystershell scales overwinter in the egg stage.
- The eggs hatch in the spring and the newly emerged insects quickly attach themselves to the plant.

Oystershell scale can be controlled in the winter by using a dormant oil.

More than 50 plant species in Colorado are attacked by the oystershell scale. Of these, ash, cotoneaster, dogwood, lilac, poplar and willow are most commonly infested.

Oystershell scales attach themselves to the bark of twigs and branches. They feed on the plant by sucking out plant sap and can weaken and even kill the plant when the infestations are abundant.

#### Control

Overwintering scales can be scrubbed off of small trees and shrubs with a plastic scrub pad. Avoid vigorous scrubbing on thin-barked trees which can be injured.

Where heavy infestations are present but limited to single branches, consider pruning. The scales and eggs on pruned wood should die within a few weeks but some precaution should be made to remove prunings from the vicinity of host trees to prevent possible infestation by crawlers.

Oystershell scales can be difficult to control because they are well protected with a thick waxy covering for most of their lives. One popular method for assisting in control is to use a horticultural oil. Most horticultural oils can also be used after leaves have emerged. Young oystershell scales—crawlers and newly settled scales—can be killed by oils applied in late spring.

After leaves have emerged oystershell scale is particularly vulnerable during the crawler stage. After this time the waxy cover prevents most insecticides (except oils) from being effective. However, the crawler stage is highly susceptible to almost all insecticides.

The occurrence of the crawlers usually occurs in late May or early June, but may vary considerably due to plant location and weather. Weekly examinations of infested plants can detect when the tiny yellow first stages of the oystershell scale have hatched from eggs and move about the plants. Close inspection can detect them, although some magnification is useful. Crawlers can be dislodged for easier view by shaking infested branches over a sheet of paper or tray. Double-sided sticky tape on branches can be used to capture crawlers for inspection.

Several insecticides that have some residual activity can be used to control crawlers during the period they are present (Table 1). Usually a single application applied to coincide with the beginning of the crawler period can kill crawlers for the subsequent few weeks that they are present.

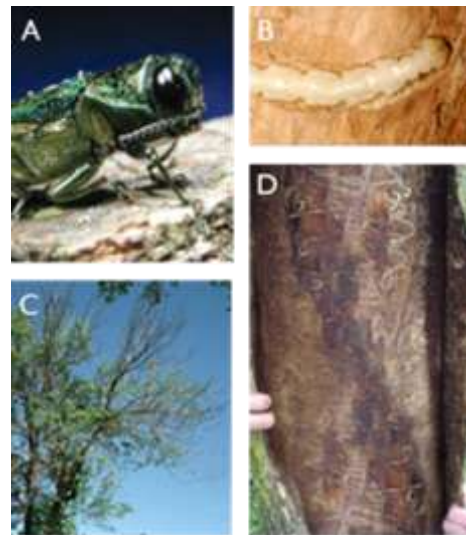
Soil-applied or trunk injected systemic insecticides (e.g., Acecaps, imidacloprid/Merit) are sometimes promoted for control of oystershell scale. Because these materials fail to move in high concentration to the areas of the plant where oystershell scale feeds, control is often poor. Systemic insecticides are not recommended for control of oystershell scale.



## *Most (un)Wanted Insects, continued*

### Emerald Ash Borer

The Emerald Ash Borer (EAB) is an invasive pest introduced from Asia that attacks ash trees (*Fraxinus* spp.) This metallic wood boring beetle was found in Detroit, Michigan and Ontario, Canada in 2002, and has continued to spread into neighboring states and eventually across the U.S. and Canada. The adult is a small, metallic green beetle only 10-15 mm in length and about 3 mm in width. The larvae live under the bark of the tree and feed in the vascular cambium. The adults typically emerge around June, leaving D-shaped exit holes in the bark. This ash tree insect briefly feeds in the canopy before reproducing and laying eggs in the twigs and branches.



A: EAB adult beetle.  
B: EAB larvae.  
C: EAB infested ash tree.  
D: EAB larval galleries.

### Symptoms

EAB larvae live under the bark and feed on the vascular tissues. Larvae create meandering galleries through the phloem, vascular cambium and etch the xylem, effectively girdling the tree. The tree responds by sprouting new (epicormic) branches below the disrupted tissues. Dieback of the canopy is a symptom of EAB larval infestation as many as one half of the branches may die back as infestation progresses. The bark will split over dead vascular tissues, and trees may die within only two years of the onset of symptoms.

### When to Treat

Treat ash if EAB is reported in your area. Do not wait for visible dieback in the canopy, as there is a significant delay between disruption to the vascular tissues and expression of symptoms in the canopy. Delaying Emerald Ash Borer treatment could result in canopy dieback or tree loss.

### Spring

Injections can be made in the spring during the growing season, about 30 days prior to expected adult emergence. Uptake of formulation is fastest when trees are actively transpiring, after they have developed a full canopy. Emerald Ash Borer treatment in the spring will prevent the adult beetles from feeding and laying eggs in the tree.

### Fall

Injections in the fall (before or after leaves color) can protect the tree now and the following season. The larvae are feeding now so they are doing a lot of damage to the vascular tissue. Proactive treatment is important since EAB larvae damage won't exhibit symptoms until next year. The treatment will remain in the tree tissue and protect the tree through the next season.

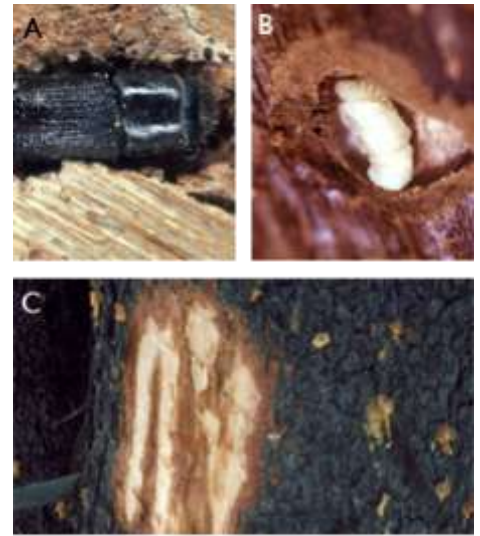
Trees need to be closely monitored for symptoms of EAB as infestation builds in your area. In general, applications are not made more than once a year. Specific insecticide formulations for EAB may provide 2 years of activity.



## Most (un)Wanted Insects, continued

### Pine Bark Beetles

There are numerous species of *Ips* and *Dendroctonus*, bark beetles, that infest conifers throughout North America. Adults tunnel through the bark, mate and lay eggs in the phloem (inner bark). The larvae develop in the phloem and cambial region; pupal development is completed in the outer bark. Adults develop from pupae and emerge by boring out through the bark. Multiple generations a year are possible.



A: Adult Southern Pine Beetle.

B: Jeffrey Pine Beetle pupa in a pupal cell within the inner bark.

C: Mountain Pine Beetle bark damage.

#### Symptoms

Symptoms of infestation include: pitch tubes, reddish boring dust, adult exit holes, and yellowing foliage. The beetles commonly attack drought stressed trees. High numbers of attacks to trees are possible, which can result in extensive vascular injury and ultimately, tree death.

#### When to Treat

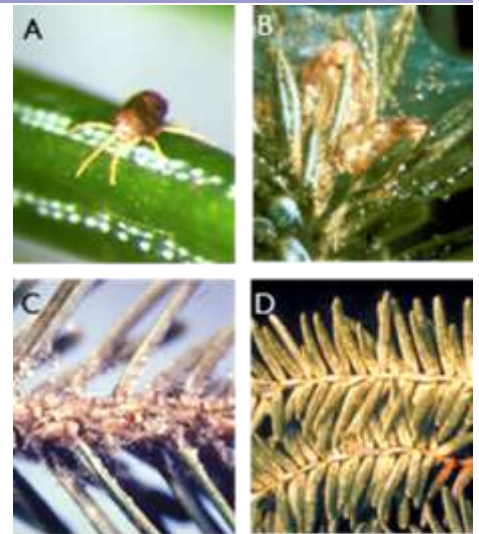
Effective injection treatment is favored by a full canopy (i.e., leaves) and healthy vascular system. Once these tissues are compromised by arthropod damage (larval galleries, defoliation, leaf mining, etc.) an effective and uniform application of TREE-äge may be difficult to achieve and subsequent control may be poor. Optimally, treatment should be made preventively at least 2 to 3 weeks before arthropods historically infest the host tree. As a result of systemic movement and longevity of TREE-äge in trees, this interval may be extended much earlier to 6 months should tree dormancy, adverse weather, management, asynchronous life cycle of pests, etc., allow earlier application timing.

TREE-äge may also be effective as a remedial treatment against some pests, such as those with slower development or if multiple life stages are susceptible to TREE-äge. Pests that attack the stem and branches such as bark beetles and clearwing borers may disrupt vascular tissue resulting in poor distribution in an infested tree. This includes the initial larval stages of pests, such as bark beetles and clearwing borers, that attack the stem and branches, which may disrupt vascular tissue resulting in poor distribution of the product in an infested tree. However, control may be achieved if larvae come into contact or feed on TREE-äge treated tissues.

## *Most (un)Wanted Insects*

### Mites

Spider mites infest a variety of conifer species, including pines, spruce, hemlocks, arborvitae and others. The mites pierce and suck nutrients from conifer needles. Because spider mites are so tiny, the easiest way to diagnose infestation is to take a twig sample from your conifer and beat it against a white piece of paper; the spider mites will appear as moving brown specks on the paper. Spider mites create webbing at the base of needles and branches.



A: Shows adult Spider Mite on spruce.  
B, C, D: Shows the symptoms of mite infestation on spruce. Note the webbing in photo C.

### Symptoms

Needles will become mottled in color. This will progress into needle discoloration and in severe infestations, needle loss.

### When to Treat

Generally, the best seasons for injection are fall and spring, as uptake occurs when trees are transpiring. The environmental conditions that favor uptake are adequate soil moisture and relatively high humidity. Soil temperature should be above 40 degrees F for trunk injection. Hot weather or dry soil conditions will result in a reduced rate of uptake, so trees should be watered if applications occur when the soil is extremely dry. If treating trees in the summer, it is best to inject in the morning for the quickest uptake. Tree health will affect treatment efficacy, so assess tree health prior to treating. For example, a declining tree (>50% canopy dieback) is a poor candidate for treatment.

ACE-jet should be applied at the first sign of mite feeding.

Since spider mites prefer hot and dry conditions, and infestation usually becomes a severe issue in the summer months. Arborjet recommends a program of monitoring environmental conditions during the summer months: during periods of summer stress, inspect trees for building mite infestations, which are particularly injurious to conifers. In other words, keep one eye on the trees and another eye on the weather. For fastest uptake rate, early morning is the best time to inject in the summer months. During hot weather, treatments should be made. Uptake rates will be fastest early in the mornings during , which is the coolest part of the day. If the soil is dry, water the tree thoroughly. ACE-jet moves rapidly into foliage for effective and if the infestation is present, this new insecticide can be injected for quick mite control kill of mites.

## *Most (un)Wanted Disease*

### Iron Chlorosis

Iron or manganese chlorosis (interveinal chlorosis) describes a condition in which a tree's foliage loses its healthy green color and fades to a pale green or yellow hue. This condition if allowed to progress will cause slow growth, leaf loss and eventually tree death. Chlorosis is often caused by deficiencies of the micro-elements iron and manganese, and is particularly prevalent in oak. In alkaline soils, iron and manganese become insoluble and unavailable to the tree. Trees growing in poorly drained soils are also susceptible to iron chlorosis.



A: Oak showing signs of Iron Chlorosis.

#### Symptoms

The primary symptom is the fading of the leaf color from green to increasingly paler shades of green and, when extreme, to an almost yellow tone.

#### When to Treat

Generally, the best seasons for injection are fall and spring, as uptake occurs when trees are transpiring. The environmental conditions that favor uptake are adequate soil moisture and relatively high humidity. Soil temperature should be above 40 degrees F for trunk injection. Hot weather or dry soil conditions will result in a reduced rate of uptake, so trees should be watered if applications are made when soil is extremely dry. If treating trees in the summer, inject in the morning for the quickest uptake. Tree health will affect treatment efficacy, so assess tree health prior to treating. For example, a declining tree (>50% canopy dieback) is a poor candidate for treatment.

For foliar chlorosis, the best time to treat is in the fall, following leaf coloration for foliage responses in the following growing season. When treating in the early spring or summer, use the lowest (micro-injection) label rates. Make applications prior to bud break in spring or, alternatively following leaf maturation (June 15). Always use the lowest label rates when treating birch trees.

#### What to Expect After Treatment

Recovery will be proportional to the level of the severity of chlorosis at the time of treatment. Response to treatment can be very rapid; you can expect to see noticeable greening and improved vitality within the growing season and often within weeks of application. Tree responses vary with soil conditions. Calcitic soils with little organic matter require comprehensive approach to treatment, including soil amendments. At Arborjet, we stress the importance of being proactive. This means that it is imperative that you treat the disease, not only the symptoms. This is why we recommend the addition of ROOT-jet Iron to the soil in order to prevent the recurrence of iron chlorosis symptoms. With the proper assessment and amendment of soil conditions, the tree may not need to be injected again for several years.

Landscape Consultants &  
Contractors, Inc.

12650 W 64th Ave. #E 430  
Arvada, CO 80004

Phone: 303-980-0360

Fax 303-420-3073

E-mail: [info@landscapeconsultantsandcontractors.com](mailto:info@landscapeconsultantsandcontractors.com)

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